

ABSTRACT

A working router is coupled to a SONET add-drop multiplexor (ADM) through a working line and a protection router is coupled to the ADM through a protection line. The routers are coupled to each other by a separate side-band connection and comprise a virtual router from the perspective of the neighboring router, which communicates with the virtual router over the SONET network using the Point-to-Point Protocol (PPP). The protection router transmits a heartbeat message to the working router over the side-band connection. If the protection router does not receive a response thereto, it initiates a line switch within the add-drop multiplexor. Once the line switch is complete, the protection router exchanges datagrams with the neighboring router, via the ADM and SONET ring to which the ADM is coupled. The protection router establishes a PPP connection between itself and the neighboring router device coupled to the SONET ring, utilizing the Link Control Protocol (LCP). The protection router includes a predetermined identifier value that identifies the originator of the request, in the LCP Identifier field of LCP request datograms. The neighboring router includes the Identifier value received in a request datagram in the corresponding response datagram transmitted over the SONET ring to the ADM. Because datograms received by the ADM from the SONET link are transmitted over both the working and the protect lines, the working router receives the same response as the protection router. Thus, by examining the identifier field, and recognizing the identifier value as that assigned to the protection router, the working router determines that the line switch to the protection router has occurred.